

NOTES ON AUSTRALIAN CESTODES

BY

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*(Received for publication 25 November, 1921)*II. *ANGULARIA AUSTRALIS*, sp. nov.

This cestode was found in considerable numbers in the intestine of a Stone Curlew (*Burhinus grallarius*, Lath.), shot near Townsville, North Queensland. It is probably rather rare, this being the only occasion on which it was encountered.

EXTERNAL ANATOMY.

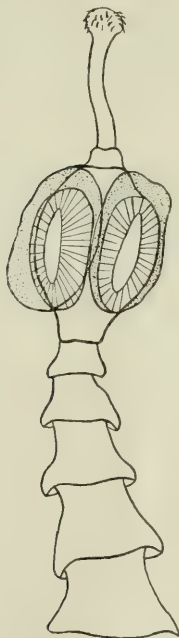
The worms are very small; the largest individual measured only about 3 mm. long; from its appearance the strobila was complete, but it had not quite reached full development. The number of proglottides in a chain varies between fourteen and twenty (fig. 1).



FIG. 1. *A. australis*. Appearance of worm as a whole. $\times 35$.

On account of its small size, there are no macroscopic characters by which it may be recognised, so the following description of the appearance as a whole had to be determined under the low power of the microscope.

Head. The head bears a relatively long, thin rostellum, which was unfortunately broken off in most cases. From base to tip the rostellum is about 150μ to 200μ long, and it is about 14μ thick. It arises from a bulbous muscular structure, which lies in a deep fossa. It projects directly forwards as a long proboscis-like organ of uniform diameter, except at the tip where it expands into a globular enlargement, about twice the diameter of the stem (figs. 2 and 3).



A. M. B., del.

FIG. 2. *A. australis*. Head, and anterior parts of strobila. $\times 70$.



A. M. B., del.

FIG. 3. *A. australis*. Tip of rostellum, shewing disposition of hooks. $\times 225$.



FIG. 4. *A. australis*. Hooks. $\times 450$.

The hooks, which measure about 25μ in length, are arranged in a zigzag line which forms four acute angles anteriorly and four acute angles posteriorly. Between an anterior and a posterior angle there are six or seven hooks. Thus, the total number of hooks is forty-eight or fifty-six. Their disposition and shape are shown in figs. 3 and 4.

The scolex is about as broad as it is long (250μ). The four suckers are relatively large oval structures, with their long axes antero-posterior; they are not exactly oval, being slightly narrower anteriorly. They measure about 130μ in length and 60μ in breadth, and their lips are provided with cuticular expansions, which project beyond the surface of the scolex (fig. 2).

Segments. For about the anterior half of the strobila the segments are quite narrow and rudimentary, the only change being a slight increase in length. But from about the mid-point of the strobila, the proglottides rapidly increase in size, and the reproductive organs reach complete maturity in the course of three or four segments. There are only three or four mature segments in each strobila, the genitalia undergoing a sudden atrophy when the uterus begins to develop, so that the two or three terminal segments contain, beside the uterus, only remnants of the reproductive organs (fig. 1).

The shape of individual segments is somewhat uncommon. Each one is like a truncated cone with the narrow end anterior, and the sides, which are concave in the anterior immature proglottides, become slightly convex in the posterior mature and gravid segments. The posterior surface of each proglottis is oval and slightly depressed in the centre, and into the middle of this depression the narrow anterior margin of the succeeding segment fits; the result of this is that the posterior borders project all round beyond the anterior portion of the following proglottis. There is no neck, but posteriorly the scolex narrows considerably to pass directly into the segmented chain. The first two or three proglottides are distinctly broader than long, and the next three or four increase in length but not in breadth, so that the sixth or seventh segment is longer than broad. Mature and gravid segments are slightly broader than long, their dimensions are about 160μ antero-posteriorly, 270μ across the anterior, and 460μ across the posterior borders respectively. But these dimensions are only approximate, on account of the rapid development of the worm. The terminal segment is nearly globular, with an invaginated pore at its posterior end.

INTERNAL ANATOMY.

Muscular system. The muscle layers are not conspicuous, and as sections were not cut, their detailed arrangement cannot be given.

Nervous system. The nervous system was not investigated.

Excretory system. The excretory canals, of which only a single one could be seen on each side, lie well towards the lateral borders, and pass ventral to the cirrus pouch and vagina.

Genitalia. Testes. The testes are arranged in the two lateral fields of the medulla with the female organs between them. They number about twenty in each segment, and there are usually one or two testes more on the aporal than on the poral side. They lie towards the posterior part of the segment on each side of the ovary (fig. 5). The cirrus pouch is relatively long and runs slightly

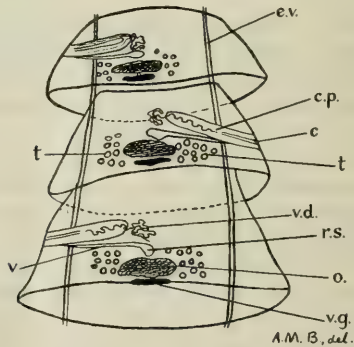


FIG. 5. *A. australis*. Mature segments. e.v., excretory vessel; c.p., cirrus pouch; c., cirrus; t., testes; v.d., vas deferens; r.s., receptaculum seminis; o., ovary; v.g., vitelline gland; v., vagina. $\times 90$.

anteriorly towards the median line. The genital pores are situated about the centre of the lateral border, and are regularly alternating in most cases, but in one or two specimens there were three openings in succession on the same side, which was the greatest irregularity observed. There is no external seminal vesicle, but the vas deferens

is thrown into many coils in front of the ovary, before it enters the base of the cirrus pouch (fig. 5).

The cirrus is a long tubular structure, and in the one instance observed, where it was extruded, it measured 120μ long and 18μ thick. It is thickly covered with spines, and has a slightly swollen tip.

Ovary. The ovary lies in the median axis towards the posterior part of the proglottides. It is a compact, oval body; its long axis is transverse, measuring about 75μ (fig. 5).

Vitelline glands. The vitellarium is small and lies transversely behind the ovary, at the extreme posterior part of the segment; in full development it measures about 40μ long (fig. 5). The ovary and vitelline glands disappear very suddenly, being apparently in full development in one segment, and almost totally absent in the succeeding one.

Vagina. The vagina is a narrow tube running posterior to the cirrus pouch. It expands in front of the ovary into a small receptaculum seminis. Details of the shell gland could not be made out.

Uterus and eggs. The uterus was not fully developed, and its mature characters cannot be detailed, but it had the appearance of an irregular sac loosely packed with eggs, and is only visible in at most the three terminal segments. No free eggs were seen, consequently their size is not known.

DIAGNOSIS.

This interesting cestode closely resembles *Angularia beema*, Clerc (1906), but differs from the latter in the following points:— (1) Its smaller size (*A. beema* measures 45 mm. long), and (2) the presence of cuticular expansions on the suckers (absent in *A. beema*). It is, therefore, proposed to name this species *Angularia australis*.

The discovery of this cestode is of considerable interest, because the only other member of this genus hitherto described is *A. beema*, which, according to Lühe (1910), is very restricted in its distribution, only having been recorded from Russia.

Type specimens of this new species are in the Museum of the Liverpool School of Tropical Medicine.

The genus *Angularia*, Clerc (1906), resembles closely the genus

Gyrocoelia, Fühmann (1899), so far as the head is concerned. Apparently, Linstow's genus *Brochocephalus* (1906) is a synonym of Fühmann's *Gyrocoelia*. The points in which the two genera differ may be summarised as follows:—

Angularia.

Vagina present.
Testes 20 to 25.
Uterus without dorsal and
ventral pores.

Gyrocoelia.

No vagina.
Testes few.
Uterus ring-like, opening by
a pore dorsally and ventrally
in gravid segments.

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